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EXAMINER	
NGUYEN, TUAN HOANG	
ART UNIT	PAPER NUMBER
2618	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No.	Applicant(s)	
	10/525,485	FISCHER, HARALD	
	Examiner	Art Unit	
	TUAN H. NGUYEN	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-18,20-23,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13-18,20-23,29 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 07/24/2008 have been fully considered but they are not persuasive.

In response to Applicant's remark on pages 2-5, Applicant argues that Smith et al. (U.S PAT. 6,243,565 hereinafter, "Smith") reference cited by the Examiner fails to disclose "each of the antennas having a transmission-connector for connecting the transmission path to the antenna and a reception-connector for connecting the reception path to the antenna," as recited in the independent claim 1. Examiner respectfully disagrees with the Applicant argument. Applicant should refer to Smith reference (fig. 1 col. 10 lines 24-39) where as the Examiner interpreted "each of the antennas (26) having a transmission-connector (22) for connecting the transmission path to the antenna (26) and a reception-connector (22) for connecting the reception path to the antenna, (44)". Since the claim languages are not specify the way for connecting the transmission/reception path to the antenna. The reference cited by the Examiner still read on. In addition, the Applicant argues that Smith fails to disclose "an antenna terminal having a plurality of antennas connected to respective switches," as cited in the independent claim 1. Examiner respectfully disagrees with the Applicant argument. Applicant should refer to Smith reference (fig. 1 col. 7 lines 36-50 and col. 8 lines 13-26) where as the Examiner interpreted "an antenna terminal having a plurality of antennas connected to respective switches," i.e., selection of the switch position of

the RF switch 24 is controlled by a controller 32 which is connected to the RF switch 24 by way of lines 34. The switch positions of the RF switch 24 are switched through a selected sequence to connect successive ones of the transmitter elements 18 with successive ones of the antenna elements 26. The teaching of the prior art reference still read on. Further, the Applicant argues that Schmidt (U.S PAT. U.S PAT. 7,260,424) reference cited by the Examiner fails to disclose in the dependent claim 2 that "wherein the signal processor is an analogue-digital signal processor formed by a direct digital synthesizer driven phase locked loop radio frequency signal generator,". Examiner respectfully disagrees with the Applicant argument. Applicant should refer to Schmidt reference (fig. 1A col. 6 lines 23-35) where as the Examiner interpreted "wherein the signal processor is an analogue-digital signal processor formed by a direct digital synthesizer driven phase locked loop radio frequency signal generator," i.e., the RF modem core 132 has a direct-conversion radio architecture with **integrated VCO and frequency synthesizer** (where as the modem integrated with the VCO and frequency synthesizer driven phase lock loop radio frequency signal generator to be able to performe digital modulation). **The RF modem core 132 includes an RF receiver connected to an analog-digital converter**, which in turn is connected to a modem **performing digital modulation,** channel filtering, AFC, symbol timing recovery, and bit slicing operations. Therefore, the teaching of the prior art references still read on.

Base on the above rational, it is believed that the claimed limitations are met by the references submitted and therefore, the rejection maintained.

2. Claims 12, 19, and 24-28 canceled.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-7, 20 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt (U.S PAT. U.S PAT. 7,260,424) in view of Smith et al. (U.S PAT. 6,243,565 hereinafter, "Smith").

Consider claim 1, Schmidt teaches transceiver apparatus for use in a multi-frequency communication system, comprising: a signal processor (fig. 1A col. 3 line 55 through col. 4 line 7), an antenna-switch comprising a multi-switch, a transmission-multiplexer and a reception multiplexer, wherein said multiplexers are controllable by the signal processor (fig. 1A and 1B col. 4 lines 34-48), a frequency conversion circuitry having a transmission path and a reception path wherein each of the paths communicatively connects the signal processor and the antenna-switch (fig. 1A col. 3 line 55 through col. 4 line 7).

Schmidt does not explicitly show that an antenna terminal having plurality of antennas connected to respective switches, each of the antennas having a transmission-connector for connecting the transmission path to the antenna and a

reception-connector for connecting the reception path to the antenna, wherein the antenna-switch, controllable by the signal processor, allows multi-frequency operation of the antenna- terminal by combining a transmission-mode and a reception-mode of each of the antennas, the signal processor controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the antennas is configured as either a transmit-only antenna or a receive-only antenna.

In the same field of endeavor, Smith teaches an antenna terminal having plurality of antennas connected to respective switches, each of the antennas having a transmission-connector for connecting the transmission path to the antenna and a reception-connector for connecting the reception path to the antenna, wherein the antenna-switch, controllable by the signal processor, allows multi-frequency operation of the antenna- terminal by combining a transmission-mode and a reception-mode of each of the antennas (col. 8 lines 13-26 and col. 10 lines 24-39), the signal processor controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the antennas is configured as either a transmit-only antenna or a receive-only antenna (col. 4 lines 10-31 and col. 9 lines 41-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, an antenna terminal having plurality of antennas connected to respective switches, each of the antennas having a transmission-connector for connecting the transmission path to the antenna and a reception-connector for connecting the reception path to the antenna, wherein the antenna-switch, controllable by the signal processor, allows multi-frequency operation of the antenna-

terminal by combining a transmission-mode and a reception-mode of each of the antennas, the signal processor controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the antennas is configured as either a transmit-only antenna or a receive-only antenna, as taught by Smith, in order to provide a transmitter diversity assembly, and an associated method, which, during operation to transmit a communication signal, creates signal diversity to mitigate the effects of transmission of the communication signal on a multi-path, fading channel.

Consider claim 2, Schmidt further teaches characterized in that the signal processor is an analogue-digital signal processor formed by a direct digital synthesizer driven phase locked loop radio frequency signal generator (col. 4 lines 49-53 and col. 6 lines 23-35).

Consider claim 3, Schmidt further teaches characterized in that the frequency conversion circuitry comprises at least one of a local oscillator and a power divider to supply a local oscillator power to the transmission path and/or the reception path (col. 4 lines 49-53 and col. 6 lines 23-35).

Consider claim 4, Schmidt further teaches characterized in that the frequency conversion circuitry comprises a mixer device for converting the signal between an intermediate frequency and a radio frequency (col. 5 line 56 through col. 6 line 7).

Consider claim 5, Schmidt further teaches characterized in that the frequency conversion circuitry comprises a direct conversion device for converting the signal between a base band frequency (zero IF) and a radio frequency, in particular by means of an IQ-method (col. 5 line 56 through col. 6 line 7).

Consider claim 6, Schmidt further teaches characterized in that the antenna switch comprises a matching unit formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna (col. 7 line 54 through col. 8 line 6).

Consider claim 7, Schmidt further teaches characterized in that the antenna switch comprises a bus connection to the signal processor, wherein the bus-connection is formed as a matching network (col. 7 line 54 through col. 8 line 6).

Consider claim 20, Schmidt teaches a method of transceiving a multi-frequency signal in a multi-frequency communication system, comprising the steps of: processing the signal in a signal processor (fig. 1A col. 3 line 55 through col. 4 line 7) operating an antenna terminal by an antenna-switch comprising a multi-switch, a transmission multiplexer and a reception multiplexer, wherein the multiplexers are controlled by the signal processor, and transceiving the signal by means of at least a selected one of a plurality of antennas of the antenna terminal, the antennas being connected to respective switches (fig. 1A and 1B col. 4 lines 34-48), frequency converting the signal

in a frequency conversion circuitry wherein frequency converting of the signal in the frequency conversion circuitry is established on a transmission path and a reception path, wherein each of the paths communicates the signal between the signal processor and the antenna switch (fig. 1A col. 3 line 55 through col. 4 line 7).

Schmidt does not explicitly show that multi-frequency antenna terminal operation is established by combining a transmission-mode of the antenna and a reception-mode of the antenna controlled by the signal processor, by means of: the antenna- switch, and communicating the signal between the transmission path and the selected antenna via the transmission multiplexer and a transmission connector of the antenna and between the reception path and the selected antenna via the reception multiplexer and a reception connector of the selected antenna, the signal processor controlling the respective switches of the antennas such that, at a particular instant in time, each of the antennas is configured as either a transmit-only antenna or a receive-only antenna.

In the same field of endeavor, Smith teaches multi-frequency antenna terminal operation is established by combining a transmission-mode of the antenna and a reception-mode of the antenna controlled by the signal processor, by means of: the antenna- switch, and communicating the signal between the transmission path and the selected antenna via the transmission multiplexer and a transmission connector of the antenna and between the reception path and the selected antenna via the reception multiplexer and a reception connector of the selected antenna (col. 8 lines 13-26 and col. 10 lines 24-39), the signal processor controlling the respective switches of the antennas such that, at a particular instant in time, each of the antennas is configured as

either a transmit-only antenna or a receive-only antenna (col. 4 lines 10-31 and col. 9 lines 41-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, multi-frequency antenna terminal operation is established by combining a transmission-mode of the antenna and a reception-mode of the antenna controlled by the signal processor, by means of: the antenna- switch, and communicating the signal between the transmission path and the selected antenna via the transmission multiplexer and a transmission connector of the antenna and between the reception path and the selected antenna via the reception multiplexer and a reception connector of the selected antenna, the signal processor controlling the respective switches of the antennas such that, at a particular instant in time, each of the antennas is configured as either a transmit-only antenna or a receive-only antenna, as taught by Smith, in order to provide a transmitter diversity assembly, and an associated method, which, during operation to transmit a communication signal, creates signal diversity to mitigate the effects of transmission of the communication signal on a multi-path, fading channel.

Consider claim 29, Schmidt teaches a communications method using a communications transceiver having multiple antennas having respective switches, a transmission path, a reception path, a transmission multiplexer, a reception multiplexer, and a processor (fig. 1A col. 3 line 55 through col. 4 line 7).

Schmidt does not explicitly show that controlling the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna from the multiple antennas and during reception the reception path is coupled to the selected antenna; and controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna.

In the same field of endeavor, Smith teaches controlling the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna from the multiple antennas and during reception the reception path is coupled to the selected antenna (col. 8 lines 13-26 and col. 10 lines 24-39); and controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna (col. 4 lines 10-31 and col. 9 lines 41-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, controlling the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna from the multiple antennas and during reception the reception path is coupled to the selected antenna; and controlling the respective switches of the multiple antennas such that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna, as taught by Smith, in order to provide a transmitter diversity assembly, and an associated method, which,

during operation to transmit a communication signal, creates signal diversity to mitigate the effects of transmission of the communication signal on a multi-path, fading channel.

Consider claim 30, Schmidt teaches communications transceiver comprising: multiple antennas having respective switches; a transmission path (fig. 1A col. 3 line 55 through col. 4 line 7); a reception path (fig. 1A col. 3 line 55 through col. 4 line 7); a transmission multiplexer coupled to the transmission path and to the multiple antennas (fig. 1A col. 3 line 55 through col. 4 line 7); a reception multiplexer coupled to the reception path and to the multiple antennas (fig. 1A col. 3 line 55 through col. 4 line 7); and a processor (fig. 1A col. 3 line 55 through col. 4 line 7).

Schmidt does not explicitly show that the processor controls the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna and during reception the reception path is coupled to a selected antenna; and wherein the processor controls the respective switches of the multiple antennas such that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna.

In the same field of endeavor, Smith teaches the processor controls the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna and during reception the reception path is coupled to a selected antenna (col. 8 lines 13-26 and col. 10 lines 24-39); and wherein the processor controls the respective switches of the multiple antennas such

that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna (col. 4 lines 10-31 and col. 9 lines 41-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use, the processor controls the transmission multiplexer and the reception multiplexer such that during transmission the transmission path is coupled to a selected antenna and during reception the reception path is coupled to a selected antenna; and wherein the processor controls the respective switches of the multiple antennas such that, at a particular instant in time, each of the multiple antennas is configured as either a transmit antenna or a receive antenna, as taught by Smith, in order to provide a transmitter diversity assembly, and an associated method, which, during operation to transmit a communication signal, creates signal diversity to mitigate the effects of transmission of the communication signal on a multi-path, fading channel.

5. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt in view of Smith and further in view of Heinonen Jarmo (European Patent Application EP 0 800 283 hereinafter, "Heinonen").

Consider claim 21, Schmidt and Smith, in combination, fail to teach characterized by directly frequency converting the signal in a frequency conversion circuitry between a base band signal (zero IF) and a radio frequency signal.

However, Heinonen teaches characterized by directly frequency converting the signal in a frequency conversion circuitry between a base band signal (zero IF) and a radio frequency signal (col. 6 lines 7-20).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Heinonen into view of Schmidt and Smith, in order to provide a transmitter/receiver for transmitting and receiving of an RF signal in two frequency bands.

Consider claim 22, Heinonen further teaches characterized by frequency converting the signal in a frequency conversion circuitry between an intermediate frequency signal and a radio frequency signal (col. 6 lines 21-30).

Consider claim 23, Heinonen further teaches characterized in that a reference of an incoming signal is processed in an antenna switch after checking a beam direction and a signal quality, in particular based on a BER-measurement (col. 1 line 53 through col. 2 line 3 e.g., digital processing included BER measurement to check a signal quality of an incoming signal).

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt in view of Smith and further in view of Garlepp et al. (U.S PUB. 2003/0017809 hereinafter, "Garlepp").

Consider claim 10, Schmidt and Smith, in combination, fail to teach characterized in that the antenna terminal comprises a patching unit formed as a low-pass-filter to improve the matching of the antenna for different frequencies and/or for different modes

of a multi-frequency communication system, in particular of a mobile cellular communication system or a personal communication system.

However, Garlepp teaches characterized in that the antenna terminal comprises a patching unit formed as a low-pass-filter to improve the matching of the antenna for different frequencies and/or for different modes of a multi-frequency communication system, in particular of a mobile cellular communication system or a personal communication system (page 21 [0241]).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Garlepp into view of Schmidt and Smith, in order to provide impedance matching in the front-end circuitry of RF apparatus.

Consider claim 11, Garlepp further teaches characterized in that the antenna terminal comprises a matching unit for the antenna, in particular an LC component, in order to provide an optimal matching factor for the antenna (page 22 [0275]).

7. Claims 8-9 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt in view of Smith and further in view of Keskitalo et al. (U.S PAT. 6,128,486 hereinafter, "Keskitalo").

Consider claim 8, Schmidt and Smith, in combination, fail to teach characterized in that the antenna switch further comprises a beam forming matrix device, in particular

a Butler-output-matrix selected from the group consisting of: a 4x4, a 8x8 and a 16x16 Butler output matrix.

However, Keskitalo teaches characterized in that the antenna switch further comprises a beam forming matrix device, in particular a Butler-output-matrix selected from the group consisting of: a 4x4, a 8x8 and a 16x16 Butler output matrix (col. 9 lines 6-23).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Keskitalo into view of Schmidt and Smith, in order to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector.

Consider claim 9, Keskitalo further teaches characterized in that matching units are provided inside the Butler-matrix, in particular a modified Butler-output matrix output/input is formed as a frequency regulated matching filter in order to provide an optimal matching factor for the antenna (col. 1 lines 36-46).

Consider claim 16, Keskitalo further teaches characterized in that the antenna has a body and the body comprises an integrated patching and/or matching unit (col. 1 lines 36-46).

Consider claim 17, Keskitalo further teaches characterized in that the antenna terminal forms a beam of 360 degrees, in particular the antenna beam is formed within

a range of 200 degrees (col. 2 lines 18-37).

Consider claim 18, Keskitalo further teaches characterized in that the antenna beam comprises a 90 degree beam, in particular the beam is formed by a 50 degree main beam and two 20 degree side beams (col. 2 lines 18-37).

8. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt in view of Smith and further in view of Cencich et al. (U.S PAT. 6,844,862 hereinafter, "Cencich").

Consider claim 13, Schmidt and Smith, in combination, fail to teach characterized in that the antenna is formed as an s-loop antenna having two ends formed as the transmission connector and/or the reception connector.

However, Cencich teaches characterized in that the antenna is formed as an s-loop antenna having two ends formed as the transmission connector and/or the reception connector (col. 2 lines 40-53).

Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate the disclosing of Cencich into view of Schmidt and Smith, in order to provide an antenna that provides high gain and wide-angle coverage with reduced size and weight, and that is particularly apt for spaceborne applications.

Consider claim 14, Cencich further teaches characterized in that the antenna is configured as a copper wired antenna, in particular as a flexible line antenna made of copper (col. 5 lines 32-39).

Consider claim 15, Cencich further teaches characterized in that the antenna is configured as a SMD-planar antenna (col. 5 lines 6-15).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any response to this action should be mailed to:

Mail Stop_____ (Explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents

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401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan H. Nguyen whose telephone number is (571)272-8329. The examiner can normally be reached on 8:00Am - 5:00Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Maung Nay A. can be reached on (571)272-7882882. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information Consider the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tuan Nguyen/
Examiner
Art Unit 2618

/Nay A. Maung/
Supervisory Patent Examiner, Art Unit 2618